



## EFFECTIVENESS OF AYURVEDIC NUTRITIOUS THERAPY IN PREVENTION AND MANAGEMENT OF MALNUTRITION, ILLNESS REDUCTION AND HEALTH IMPROVEMENT OF MOTHERS AND CHILDREN

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**ABSTRACT** **Introduction-** According to UNICEF, India is at No. one in the 10th spot among countries with the highest number of underweight children, and at the 17th spot for the highest number of stunted children in the world. Nearly half of all deaths in children under 5 are attributable to under nutrition, translating into the loss of about 3 million young lives a year. It is of the 48 hours after birth is most crucial period, with quality health care throughout pregnancy and child birth, many these deaths could be prevented, adequate breastfeeding help to reduces child malnutrition, infection, diabetes, obesity .and etc. WHO has launched maternal death and surveillance and response (MDSR), a key strategy for reducing preventable maternal morsstality. In this study we used Ayurvedic nutritious therapy as a preventive care which helps to improve digestion, rejuvenation, immunity, srotasakarya-saptadhatu vridhhi and work on medicament requirement and need as per the type, age of the beneficiary as well as area and atmosphere according to Ayurveda and epidemical deseases. It is also similar to the MNT (medicament nutritious therapy) guidelines provided by WHO for the management of malnutrition. This study was conducted with the objective to evaluate its effect on illness due to decreased in immunity level, nutritional grade and weight on children less than 6 years of age along with change in haemoglobin level in 3 years to 6 years of age group. Second objective was to evaluate its effect on change in the weight haemoglobin and immunity level of breastfeeding mother and in pregnant women.

**Methodology-** By simple random sampling, 1035 cases and 1019 controls from age group 0 to 6 years of age children, for breastfeeding mother 186 cases and 153 controls and for pregnant women 234 cases and 102 controls were selected after taking all required permission from all concern department of Maharashtra government. Data was analysed. In

**results-** we find significant increase in weight and thereby increase in nutritional grade in cases of 0 to 6 years of children. Increased in weight was found in 97.1% cases and 82.8% control. 40% cases show increased level on nutritional as compared to 8.4% of controls. Haemoglobin level was significantly increased (91%) in cases as compared to control (36.51%). This nutritious therapy was also useful in breastfeeding and pregnant women for increasing in weight and haemoglobin level in them.

**Conclusion-** This low cost highly effective verified Ayurvedic nutritious therapy can be used with daily food of children as therapeutic supplementary as improvement in digestion and rejuvenation as it is proved to be effective in increasing the weight, haemoglobin level nutritional grade level and immunity which help in minimize frequently illness in these children, in pregnant women and in lactating mothers.

**KEYWORDS :** Nutritious ayurvedic therapy, malnutrition, children, breastfeeding mothers

### INTRODUCTION-

Malnutrition, according to the World Health Organization (WHO) <sup>(1)</sup>, refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients. It is well-known that maternal, infant, and child nutrition play significant roles in the proper physical and intellectual growth and development, including future socio-economic status of the child.

According to World health organization the incidence of low weight at birth estimates that more than 20 million children, every year <sup>(2)</sup> and approximately 150 million children younger than 5 years have low weight patterns for their age. <sup>(3)</sup>

According to UNICEF, in 2017 globally, 51 million children under five were wasted of which 16 million were severely wasted. This translates into a prevalence of 7.5% and 2.4%, respectively <sup>(4)</sup>. Malnutrition and poor diets constitute the number-one driver of the global burden of disease. We already know that the annual GDP losses from low weight, poor child growth, and micronutrient deficiencies average 11 percent in Asia and Africa—greater than the loss experienced during the 2008–2010 financial crisis <sup>(5)</sup>.

Nearly half of all deaths in children under 5 are attributable to under nutrition, translating into the loss of about 3 million young lives a year. Under nutrition puts children at greater risk of dying from common infections, increases the frequency and severity of such infections, and delays recovery. <sup>(4)</sup>

While the percentage of stunted children under 5 reduced from 48% in 2005-06 to 38.4% in 2015-16, there has been a rise in the percentage of children who are wasted from 19.8% to 21% during this period in

India <sup>(6,7)</sup>. A high increase in the incidence of wasting was noted in Punjab, Goa, Maharashtra, Karnataka, and Sikkim. <sup>(8)</sup> Further, more than half of India's children are anaemic (58%), indicating an inadequate amount of haemoglobin in the blood. This is caused by a nutritional deficiency of iron and other essential minerals, and vitamins in the body. Every 2 child birth, one is malnourished therefore about 50% of our nation is alarming condition. India is number one in top 10 undernourished countries of the world.

According to Ayurved, starvation, consuming dry food (*Ruksh ahar*) etc are the reasons of malnutrition. People with malnutrition / under nourishment or over nourishment / obesity are always prone to some or the other ailment. Therefore, to cure these conditions, malnutrition in the instant case, "Brihanachikitsa" (i.e. administering medication and nutrition) is prescribed. <sup>(9)</sup>

Even though the main causes are lack of food and poor diet because of poverty and unemployment. It is also due to an illiteracy and ignorance about food, hygiene and health; natural, financial and geographical calamities; diseases due to lack of potable water and proper sanitation. Food intake without hand wash leads to contracting worms and infectious diseases. For under privilege society the medical treatment is beyond their pocket limit. Until not focused on the issue of illness we cannot give justice to our efforts properly.

Birth from weaker or malnourished parents (bijadosh). The reasons for which any disease persists for a long time makes individual sever malnourished. A malnourished individual cannot bear Stuffed meals, appetite, thirst, diseases, acute/heavy dose of medicines medicines, and even extreme heat, cold. Since malnourished person is suffered from hyposthenia naturally, many diseases cause them to be annoying.

Both Overweight and underweight malnourished individual are suffering from any kind of illness. For this, there should be karshan (less intake) and bruhan (Nourishing) diet with medicinal therapy respectively.<sup>(10)</sup>

According to the modern science the reason for malnourished child because of repeated infection like diarrhoeas, pneumonia, infectious diseases where his/her appetite is poor, digestive capacity is also affected and immune status is also depressed causing a vicious cycle infections and infestation.

Malnutrition has a huge magnitude therefore it is difficult to treat every children or individuals at their door step or at the field level. Moreover, though the treatment is free at the Public Health Centers, but these are located in periphery and the patients face difficulty to access Public Transport, while some cannot even afford it. Taking ill children to the PHCs for the treatment, individuals may lose their daily livelihood which some cannot afford and due to this they prefer homely or blind believes treatment. Looking at all these reasons, individuals tend to ignore minor health issues, which later on turn into chronic diseases. Thus they get stuck in the vicious circle of malnutrition.

To eradicate malnutrition, government is providing day to day meal (hot cooked food) and take home ration (THR) to the beneficiaries. However, this has been unable to solve the entire problem. Here we want to take your attention that Malnutrition is weakening the affected individual physically and intellectually and further has been found to reduced immunity also owing to this decreased immunity, the individual get easily affected by the surrounding infections and suffers from various diseases which may prove fatal. Therefore frequent illness is one of the major symptoms of malnutrition. If victim not getting or treated by the medicament supports as a results, the victim suffers from various irreversible damages at every stage of their life and gets stuck in the vicious circle leading to stunted growth.

Therefore, our concept is give the medicament support through nutrition to prevent, manage control and eradicate malnutrition. If we want all-round growth of our society, the society should be free from malnutrition. To strengthen the hands of the Government we came out with a unique concept "Doctors at your door steps" to help manage health issues due to malnutrition, by using Ayurvedic Medicament Nutrition Therapy.

Even in the recent directives published by WHO Medicament Nutrition Therapy has been recommended. This simply means that along with the nutrition, medicament support is also necessary to save individuals from the clutches of Malnutrition. It also says that MNT is a therapeutic approach to treating medical condition and it can be integral part of managing acute and short term diseases. It can also play a major and instrumental role in supporting the health. Since the year 2006 Gowardhan Foundation is working on similar lines to eradicate malnutrition from the roots.

In this regards, ICDS and Tribal Department take initiative and passed the Government resolution on 13th Feb., 2009 no.MBV-200/160/K8, to conduct research project. As per the G.R., Women and Child welfare act as controlling Authority and they conducted this programme.

**Objective**

To find out the effectiveness of Ayurvedic Nutritious Therapy in

- 1- 0 month to 6 years children
- 2- pregnant and lactating mothers
- 3- 0 month to 6 months children (Suckling Infants)

**STUDY DESIGN OF RESEARCH WORK-**

**METHODOLOGY-**

**Study design-** Randomized control trial

**Study period-** 90 days

- **Criteria for Inclusion-** As per the criteria of WHO, malnutrition grades children were selected by PHCs (Adivasi belt of thane district of Maharashtra- Jamsar, Sakur, Nandgaon PHC) were included in this study.
- Breastfeeding mothers having 0 to 6 months child (breastfeeding mother group)
- **Sample size-** 2054 children (0 to 6 year age group), 339 breastfeeding mother and 336 pregnant women.
- Out of 2054 children, 1035 were randomly allocated as cases who received Ayurvedic nutritional therapy as a nutritional

intervention and 1019 children were as controls who did not receive any intervention. Similarly, out of 339 breastfeeding mother, 186 were cases and 153 were controls. Total 336 pregnant women were selected from the same study area, out of which 234 cases and 102 controls were selected randomly.

- **Sampling technique-** Stratified random sampling.
- The children in cases were selected from 100 anganwadis which were randomly selected from 4 Primary health centre areas. It was decided that 2 children from the age group of 6 month – up to 2 years, 3 children of the age group of 2- up to 3 years and 5 children from age group of 3- up to 6 years making it the total of 10 children from each Anganwadi were randomly selected. The children in control group were similarly chosen from other randomly selected 100 Anganwadis. While choosing the beneficiaries preference was given to children of grade 3 & 4 (lowest grade of malnutrition). If the same were not available in that grade then the children on the borderline of this grade were chosen. Blood were tested for Hb % of children in the age group of 3 yrs to 6 yrs. Breastfeeding mothers and pregnant mothers were selected randomly from the same study area.
- **Criteria for Exclusion-** Congenital deformities, tweens, premature births, history of HIV positive parents and baby, recently detected Tubercular and recently hospitalised babies were excluded from study
- Before and after nutritious therapy- investigation- Height, weight, haemoglobin
- Those were not having malnutrition were also excluded.

**Drug review-**

Criteria for selection of ayurvedic poshak, *balya* (to increases the body weight), *rasayan* (immunity), *sapta dhatu poshak* (overall body constituents boosters enhancers), herbs were selected There are two types of the constituents: *Ayurvedic* Dietary and herbal constituents according to beneficiary groups.

- **Ayurvedic Dietary Constituents** are Soya, Whole Wheat, Ragi, Til (seasum), Halim, Spinach, Beetroot, Skimmed Milk, Vegetable Oil by sunflower, Cow Ghee, sugar and Jaggary, which are common in all products.
- **Ayurvedic Herbal Constituents** are Shatawari, Ashwagandha, Amalaki, Vidarikand, Arjun, Balhirda, Behada, Dikemali, Haldi, Hirda, Jeshthamadhi, Kutaj, Kakadshingi, Murudsheng, Myphal, Nagarmotha, Pimpali, Karanj, Sunthi, Vavdinga, Vekhand, Gulvel, Jatamansi, Manjishtha, Gokharu, Wakeri, Chopchini, Kuda, Brahmi, Shankhapushpi. which are according to the needs of the beneficiary group.
- **Plan for drug administration and Number of study days-** Modalities and administration for sake of palatability and easy administration the same about drugs were used to prepare
  - 1- Kalp (granules)- 1 tsf = 2.5 grams
  - 2- Biscuits – 5 grams

As there is a fear or misconceptions regarding any sort of medicines exclusively in Adivasis, taking this into consideration the poshak therapy given in the form of food supplements such as biscuits and granules which with the aim easy acceptability from study population.

Selection of the formulation is based on the nutritional values of the ingredients which is supported by evaluation of combination by the drugs controller laboratories pharmacognosy division laboratory.

	Parameter	Shishu Nutrayur Cookies for 6 mon to 3 yrs	Chiranji vi Nutrayur Cookies for 3 to 6 Yrs	Nutrayer Cookies for Pregnant women	Shishu Nutrayur Cookies Lactating	
SR NO	TEST	In 100 gm	In 100 gm	In 100 gm	In 100 gm	Unit
1	FAT	13.4	13.1	13.1	13.6	Gm
2	PROTEIN	14.2	13.6	13.6	13.2	Gm
3	ENERGY	437.8	443.5	443.5	441.6	Kcal
4	CARBOHYD RATE	65.1	67.8	67.2	67.1	Gm
5	VITAMIN C	24.5	22.6	26.6	20.5	Mg
6	VITAMIN A	253.1	321.4	260.8	300.8	IU
7	VITAMIN B 1	0.43	0.5	0.24	0.28	Mg
8	VITAMIN B 2	0.23	0.3	0.37	0.28	Mg

9	VITAMIN (B-6)	0.04	0.4	0.047	0.04	Mg
10	IRON	8.5	7.4	9.4	8.6	Mg
11	CALCIUM	238	232	226	216	Mg

**Dosage of therapy-** (ayurvedic nutritious therapy was given in the form of ayurvedic kalp and biscuit.

- For 6 months to 1 year child- 2.5 gram of ayurvedic kalp -twice a day.
- For 1 year to 3 year child- 2.5 gram of ayurvedic kalp was given twice a day and one biscuit of 5 gm was given once a day.
- In 3 years to 6 years children- 2.5 gram ayurvedic kalp and one biscuit of 5 gm twice a day.
- For pregnant women and breastfeeding mother- 5 gram ayurvedic kalp and 2 biscuit of 5 gram each twice a day.

This product also helps to full fill the nutritional gap between the diet provided by government as well as their own routine diet and actual recommendation as per RDA up to some extent. We also design the recipe in such a way that the product should be tasty and catchy form because of these 100% intake of dosage gets sure. As well as joyfully consumed by the beneficiaries make sure 100% assimilation of therapy.

To know the social cause behind this mission we made available these cookies in very economical course price. These product are very economical in comparison to products that offer similar nutritional and medical benefits of nutrients which are available in the market. More valuable things is that in this price we helps to assure illness free, healthy, physically and intellectually development of future generation. This leads to make well academically carriers and ultimately bright future of individuals, society and nation too.

**Analysis of data-** All data were collected and entered in Microsoft excel to make graph and tables. SPSS version 20 software is used to find out the significant between cases and controls with the help of paired and unpaired t test, chi square test.

**RESULTS-**

In the study, out of 1035 cases, 45.21% were boys and 54.78% were girls. In control group, out of 1019, there were 48% boys and 52% were girls. In 0 to 6 month age group 266 (cases-116, control- 150), in 6 month to up to 2 years 370 (cases-185, control- 185), in 2 year to up to 3 year 495 (cases-256, control- 239) and in 3 year to 6 years 923 (cases-478, control- 445) children were participated in study. (Table no 1)

**Table no 1- age and sex wise classification of cases and controls**

AGE WISE CLASSIFICATION	CASES		CONTROL		TOTAL (CASES AND CONTROLS)
	BOYS	GIRLS	BOYS	GIRLS	
<b>0 to 6 month</b>	46 (39.65%)	70 (60.34%)	82 (54.66%)	68 (45.33%)	266 (12.95%)
Total	116		150		
<b>6 month to 2 year</b>	78 (42.16%)	107 (57.83%)	88 (47.56%)	97 (52.43%)	370 (18.01%)
Total	185		185		
<b>2 years to 3 years</b>	113 (44.14%)	143 (55.85%)	108 (45.18%)	131 (54.81%)	495 (24.09%)
Total	256		239		
<b>3 years to 6 years</b>	231 (48.32%)	247 (51.67%)	212 (47.64%)	233 (52.35%)	923 (44.93%)
Total	478		445		
<b>Total</b>	468 (45.21%)	567 (54.78%)	490 (48.08%)	529 (51.91%)	2054 (100%)
	1035 (50.38%)		1019 (49.61%)		

**Effect of ayurvedic nutritious therapy on weight of 0 to 6 years of children-**

In the study, there was increased growth seen in 1105 (97.1%) cases and in 844 controls (82.4%). Maximum growth was seen in 0 to 6 age group followed by 3 - 6 years cases. In 86 (8.4%) controls and 5 (0.48%) cases, there was decreased in growth. In 25 (2.4%) cases and 89 (8.7%) control, no change in growth was seen. (Table no 2 and 3)

**Table no 2- Evaluation of weight in cases and control age wise**

Age ↓ Weight ↑	Increased	Decreased	Not Changed	Total
<b>0 to 6 month</b>				
<b>Case</b>	115 (99.1%)	0 (0%)	1 (0.86%)	116 (100%)
<b>Control</b>	135 (90%)	2 (1.3%)	13 (8.6%)	150 (100%)
<b>6 month to 2 year</b>				
<b>Case</b>	175 (94.5%)	1 (0.54%)	9 (4.86%)	185 (100%)
<b>Control</b>	152 (82.6%)	14 (7.56%)	19 (10.2%)	185 (100%)
<b>2 years to 3 years</b>				
<b>Case</b>	251(98%)	1 (0.39%)	4 (1.5%)	256 (100%)
<b>Control</b>	198 (82.8%)	27 (11.29%)	14 (5.8%)	239 (100%)
<b>3 years to 6 years</b>				
<b>Case</b>	464 (97%)	3 (0.62%)	11 (2.3%)	478 (100%)
<b>Control</b>	359 (80%)	43 (9.6%)	43 (9.6%)	445 (100%)
<b>Total</b>				
<b>Cases</b>	1105 (97.1%)	5 (0.48%)	25 (2.4%)	1035 (100%)
<b>Control</b>	844 (82.8%)	86 (8.4%)	89 (8.7%)	1019 (100%)

Mean increase in weight in 0 to 6 month of children was 1.2kg in cases and 0.4 kg in control. Mean increased in weight of 6 month to 2 years, 2 to 3 years and 3 to 6 years in cases was 0.7 kg, 1.1 kg, 0.8 kg and in control it was 0.04 kg, 0.8 kg, 0.3 kg respectively. (Table no 3)

**Table no 3- Mean increased in weight in cases and in controls**

Visit ↓ Mean weight increased in age group ↓	Cases		Control		Comparison between 4th visit of case & control
	1st visit (before treatment)	4th visit (after treatment)	1st visit (before treatment)	4th visit (after treatment)	
<b>0 to 6 month</b>	4.49 kg	5.6 kg	3.5 kg	3.9 kg	P<0.000
<b>Mean increased in weight</b>	1.2 kg		0.4kg		
<b>6 month to 2 year</b>	7 kg	7.7 kg	5.05 kg	5.09 kg	P<0.000
<b>Mean increased in weight</b>	0.7 kg		0.04 kg		
<b>2 year to 3 year</b>	7.6 kg	8.7 kg	7.7 kg	8.5 kg	P<0.000
<b>Mean increased in weight</b>	1.1 kg		0.8 kg		
<b>3 year to 6 year</b>	8.4 kg	9.2 kg	8.1 kg	8.4 kg	P<0.000
<b>Mean increased in weight</b>	0.8 kg		0.3 kg		

**Change in weight and haemoglobin level in breastfeeding mothers-**

Ayurvedic nutritious therapy was given to 186 breastfeeding mother (cases) were compare with 153 breastfeeding control group. There was increased weight in 183 (98.38%) cases and in 86 (56.2%) controls. Increase in haemoglobin level was seen in 159 (85.48%) cases and in 71 (46.41%) controls. (Table no 4)

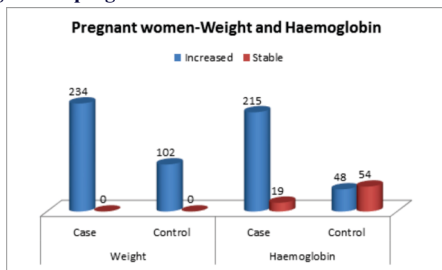
**Table no 4- Change in weight and haemoglobin level in breastfeeding mothers**

Breast feeding mother		Increased	Decreased	Stable	Total	P
Cases	Weight	183 (98.38%)	0 (0%)	3 (1.6%)	186 (100%)	<0.000
Control	Weight	86 (56.2%)	19 (12.41%)	48 (31.37%)	153 (100%)	
Cases	Haemoglobin	159 (85.48%)	0 (0%)	27 (14.53%)	186 (100%)	<0.000
Control	Haemoglobin	71 (46.41%)	2 (1.3%)	80 (52.28%)	153 (100%)	

**Effect of ayurvedic nutrition on Weight and haemoglobin level in pregnant women-**

This ayurvedic nutritious therapy was given to 234 pregnant women (cases) and there were 102 pregnant women who were controls. It was found that, all pregnant women including cases and controls had increased in weight, 215 (91.88%) cases had increased in haemoglobin level from cases and 48 (47%) from control. 19 (8.11%) cases and 54 (52.94%) controls had decreased level of haemoglobin level. It was found statistically significant when we compared change in haemoglobin level in cases and controls. (chi square=83.917, p<0.005) (Graph no 1)

**Graph no 1- Effect of ayurvedic nutrition on Weight and haemoglobin in pregnant women**



**Mean increased in weight and haemoglobin level in pregnant women and in breastfeeding mothers-**

Mean increased weight in pregnant women was 4.43 kg in cases and 2.24 kg in controls whereas in breastfeeding mothers it was 1.6 kg in cases and 0.7 kg in controls. Mean haemoglobin increased in pregnant women was 1.3 mg% in cases and 0.19 mg% in controls whereas in breastfeeding mothers it was 1.19 mg% in cases and 0.2 mg% in controls. (Table no 5)

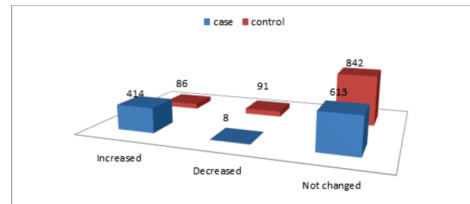
**Table no 5- Mean increased in weight and haemoglobin level in pregnant women and in breastfeeding mothers**

Visit	Cases		Control		Comparison between 4th visit of case & control
	1st visit (before treatment)	4th visit (after treatment)	1st visit (before treatment)	4th visit (after treatment)	
Pregnant women	40.36 kg	44.79 kg	40.48 kg	42.72 kg	P<0.000 F=5.904
Mean increased in weight	4.43 kg		2.24 kg		
Breastfeeding mothers	40.58 kg	42.18 kg	40.26 kg	40.96 kg	P<0.001 F=7.900
Mean increased in weight	1.6 kg		0.7 kg		
Pregnant women Hb	7.6	8.9	7.82	8.01	P<0.000 F=0.316
Mean increased in Hb	1.3 mg%		0.19 mg%		
Breastfeeding mothers Hb	7.39	8.58	7.9	8.1	P<0.002 (1.284)
Mean increased in Hb	1.19 mg%		0.2 mg%		

**Nutritional grade level- Increased, decreased and not changed in the nutritional grade of children** Out of 1035 cases, 414 (40%) children and only 86 (8.43%) out of 1019 control had shown increased level of nutritional grade. Only 8 (0.7%) cases show decreased nutritional grade whereas 91 (8.93%) controls had decreased nutritional level. (Graph no-2)

Decreased or unchanged in nutritional grade was found in 621 (39.96%) cases and 933 (60.04%) in control. (chi square=320.69, p<0.000)

**Graph no-2 Change in nutritional grade level in cases and in controls**

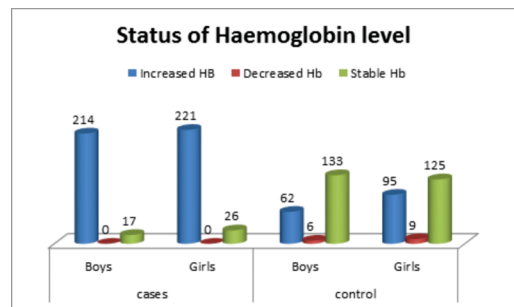


**Haemoglobin level in the age group of 3 years to 6 years-**

From cases, 478 children from age group of 3 to 6 years and 430 from control group were included for haemoglobin testing.

214 (49.19%) boys and 221 (50.8%) girls from cases had increased in haemoglobin level. From controls, only 157 (36.5%) (62 boys and 95 girls) had increased level of haemoglobin. (Graph no 3).

**Graph no 3- Status of haemoglobin level in cases and in controls in 3 to 6 years of children**



**Effect on health and diseases in children-**

At 4<sup>th</sup> visit of cases and controls, we found that 75 (7.24%) of cases were having illness such as fever, ear ache, running nose or cough, loose motion etc but in controls it was found to be very high i.e. (24.80%). It was found to be significantly associated (p<0.000). (Table no 6)

**Table no 6- Effect on health and diseases**

At 4 <sup>th</sup> visit	Cases	Controls	Total	Chi square	P
Diseases present	75 (7.24%)	427 (41.90%)	502 (24.80%)	333.97	<0.00001 (significant)
No diseases	960 (92.75%)	592 (58.09%)	1552 (75.55%)		
<b>Total</b>	1035 (100%)	1019 (100%)	2054 (100%)		

**DISCUSSION-**

Weight gain was found in 97.1% cases and 82.8% control. In 0 to 6 month cases, mean weight during 1st visit was 4.49 kg and during 4th visit it was 5.6 kg. In control, mean weight during 1st visit was 3.5 kg and during 4th visit it was 3.9 kg.

In 1<sup>st</sup> visit of 6 month to 2 years cases, mean weight was 7 kg and it was increased to 7.7kg in 4<sup>th</sup> visit whereas in control it was 5.05kg in 1<sup>st</sup> visit and 5.09kg in 4<sup>th</sup> visit. In cases of 2 to 3 years, it was 7.6 kg and 8.7 kg in 1<sup>st</sup> and 4<sup>th</sup> visit respectively whereas it was 7.7 kg and 8.5 kg in 1<sup>st</sup> and 4<sup>th</sup> visit of control of same age group. In cases of 3 to 6 years of age 8.4 kg in 1<sup>st</sup> visit and 9.2 kg in 4<sup>th</sup> visit whereas in control, 8.1 kg in 1<sup>st</sup> visit and 8.4 kg in 4<sup>th</sup> visit was found.

This weight gain was found significant when compared with 1<sup>st</sup> and 4<sup>th</sup>

visit of cases as well as with weight gain of control with the help of paired and unpaired t test. ( $p < 0.000$ ) (Table no 3)

In breastfeeding mothers, mean increase in weight was 1.6 kg in cases and 0.7 kg in control group whereas mean haemoglobin level increased was 1.19 mg% in cases and 0.2 mg% in control group. This increased in weight and haemoglobin level was found to be significant in cases as compared to control ( $p < 0.000$ ) (Table no 5)

This ayurvedic nutritious therapy was also given to pregnant women, in whom all cases and controls had increased in weight, but the mean increased in weight was 4.43 kg in cases and 2.24 kg in control. Mean haemoglobin level increased in cases was 1.3 mg% and in control it was 0.19 mg%. It was found statistically significant when we compared change in weight and haemoglobin level in cases and controls. (chi square=83.917,  $p < 0.005$ ) (Table no 5 and Graph no 1)

40% cases show increased level on nutritional grade after intervention of ayurvedic nutritional therapy and only 8.4% from control show such increase in nutritional grade. 8.93% of control show decreased nutritional grade and only 0.7% cases show such decreased in nutritional grade during study. (Graph no 2) Increased in nutritional grade in cases from grade IV to Normal when compared with control, it is found statistically significant. ( $p < 0.005$ )

Maximum increased in nutritional grade from II to I was found in 287 (27.72%) children from cases and 49 (4.80%) from control group. Nutritional grade change from I to normal found in 57 (5.5%) and 18 (1.76%) of cases and control respectively. Change from III to II was found in 56 (5.4%) of cases and 16 (1.5%) of control. Grade IV to Grade III changed for 4 (0.38%) cases and 1 (0.098%) control. In control group, maximum decrease in nutritional grade was found in 47 (4.6%) children in them grade change was from I to II.

Haemoglobin level was significantly increased (91%) in cases as compared to control (36.51%) of 3 to 6 years of age. In control group, we saw decreased level of haemoglobin in 3.48% or no change in 60%, but in cases there was not a single child had decreased haemoglobin and only 9% had stable haemoglobin level. We compared haemoglobin level of cases with that of control, There is significant change in level of haemoglobin as compared with control ( $p < 0.000$ ) (Graph no 3)

Nutritional intervention with this ayurvedic nutritious product showed significant weight gain among children with grade I and grade II protein energy malnutrition.

Ultimately, we found that this ayurvedic nutritious therapy was very helpful in decreasing the incidence of illness in cases as compared with control (table no 6)

#### RECOMMENDATION-

It is cost effective product can be added to regular food of children which will help in increase in their weight and haemoglobin level which will directly increase the immunity of child to fight with common childhood infections. As government of India has goal of elimination of malnutrition from India by 2022 and as per the N4G (Nutrition for Globe) by 2030-malnutrition free world, we can use this therapy to help to achieve this goal as from this study we can say that it will help to increase 5 time more increase in gradation of malnutrition as well as minimise ill effects by malnutrition.

#### CONCLUSION-

We can say that this ayurvedic nutritious therapy decreases the incidence of illness which might be due to increase in immunity, improved in appetite and digestion therefore results in consumption of food was increased and shown anabolic effect due to this possible mechanism of weight gain (5 times more as compared to controls) and haemoglobin level are increased.

Results of this study are very encouraging and this ayurvedic therapy is found to be very effective in improvement in weight, nutritional grade, haemoglobin level and overall health of all children as well as pregnant and lactating women of all age group.

#### Factors to be considered to draw any conclusion -

Socio-Economical status, awareness of health/ANC care, frequent pregnancies, no adequate support from family members, lack nutritious diet, addicted parents, hard strenuous work, instable life

styles, inadequate facilities in remote area, traditional customs prohibit them get delivered at health centres

#### Scope-

##### This product helps in-

- Decrease frequency of illness
- Improvement in health status, weight, Hb and immunity level
- It can help in foetal development at physical and intellectual level as well as minimise the low birth weight because the ingredient of the product is known for that.
- Helps in minimising complication during pregnancy and at the time of delivery
- Adequate breast feeding results in increase quality and quantity of lactation help to improve in suckling infants at immunity and weight gaining level, minimise mortality.

##### Further scope of research-

Results in hand is so encouraging which tempted any research scholar to further proceed with

1. Find out results in during total duration of ANC
2. Find out results for long duration study in malnutrition's area
3. Therefore, there is scope to manage the malnutrition for all strata of society.
4. The competent government authority should implement on large scale pan India

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